OCT 1 2 1943

Volume IV OCTOBER 1943 Number 10.

Medical Library

DISEASES OF THE NERVOUS SYSTEM

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

PUBLISHED MONTHLY for the PHYSICIAN in the GENERAL PRACTICE of MEDICINE

CONTENTS:

MISFITS IN THE MILITARY SERVICE (Page 293)
Col. Franklin G. Ebaugh, M.C., Dallas, Texas

MYASTHENIA GRAVIS AND CURARE SENSITIVITY (Page 299)
A. E. Bennett, M.D., Omaha, Nebraska, *and* Capt. Paul T. Cash, M.C., U. S. Army

THE TREATMENT OF VARIOUS DEPRESSIVE STATES BY ELECTRIC SHOCK (Analysis of 133 Consecutive Cases) (Page 302)
Lewis A. Golden, M.D., New Orleans, Louisiana

SUBDURAL HEMATOMA IN CHILDREN (Page 307)
M. G. Peterman, M.D., Milwaukee, Wisconsin

THE PROFESSIONAL NEUROSIS OF THE PHYSICIAN (Studies in Professional Neuroses No. III) (Page 310)
Ernest Harms, New York, New York

NEUROLOGICAL CLINICAL PATHOLOGICAL CONFERENCE OF THE CINCINNATI GENERAL HOSPITAL (Page 315)

BOOK REVIEW, SANITARIA

ASSOCIATE EDITORS

Peter Bassoe, M.D.—Chicago, Illinois
A. E. Bennett, M.D.—Omaha, Nebraska
Franklin G. Ebaugh, M.D.—Denver, Colorado
O. Spurgeon English, M.D.—Philadelphia, Penn.
Temple Fay, M.D.—Philadelphia, Penn.
Hamilton Ford, M.D.—Galveston, Texas
Walter Freeman, M.D.—Washington, D. C.
Jas. K. Hall, M.D.—Richmond, Virginia
George T. Harding, M.D.—Columbus, Ohio
A. Hauser, M.D.—Houston, Texas
Eugen Kahn, M.D.—New Haven, Connecticut
Louis J. Karnosh, M.D.—Cleveland, Ohio
Jacob Kasanin, M.D.—San Francisco, California
H. Beckett Lang, M.D.—Albany, N. Y.
Frank H. Luton, M.D.—Nashville, Tennessee
Wm. Malamud, M.D.—Worcester, Massachusetts
Donald McEachern, M.D.—Montreal, Canada
Karl A. Menninger, M.D.—Topeka, Kansas
Adolf Meyer, M.D.—Baltimore, Maryland
Glenn Myers, M.D.—Los Angeles, California
Hans H. Reese, M.D.—Madison, Wisconsin
Paul I. Schroeder, M.D.—Chicago, Illinois
Theodore A. Watters, M.D.—New Orleans, La.
S. Bernard Wortis, M.D.—New York, N. Y.
Wm. Walter Young, M.D.—Atlanta, Georgia

Titus H. Harris, M.D.
Galveston, Texas
EDITOR-IN-CHIEF

YEARLY SUBSCRIPTION $2.50
SINGLE COPIES 25 Cents

George Bieger, B.S., LL.B.
Chicago, Illinois
MANAGING EDITOR

THE

RING SANATORIUM AND HOSPITAL

Arlington Massachusetts

Eight miles from Boston at an elevation of 400 feet

63rd Year

Specializing in the individualized care of Neuropsychiatric illnesses and Habit conditions. All accepted Therapies under the direction of a resident medical staff and trained assistants. Cottage plan permits a variety of accomodations.

VOLTA ROSS HALL, M.D.
Acting Medical Director

HALLAM T. RING
Administrator

In conjunction: The Ring School of Psychiatric Nursing

THE HARDING SANITARIUM

WORTHINGTON, OHIO

For Nervous and Mental Disorders

NINE MILES NORTH OF STATE HOUSE—COLUMBUS

GEORGE T. HARDING, M.D., *Medical Director*
HARRISON EVANS, M.D.

FRED H. WEBER, M.D.
MARY J. WEBER, M.D.

COMPTON SANITARIUM
AND
LAS CAMPANAS HOSPITAL

COMPTON, CALIFORNIA
(Near Los Angeles)

Compton Sanitarium is a private psychiatric hospital with 120 beds. Emphasis is given psychotherapy by a staff of resident psychiatrists. Other treatment procedures are duly evaluated and administered. Careful records are maintained. There are psychiatrically trained graduate nurses; student nurses through affiliation; nursing attendants; dietitian; occupational therapist; recreational therapist; hydrotherapist; masseuse. Las Campanas Hospital (43 beds) provides adjunct general hospital facilities. Compton Sanitarium and Las Campanas Hospital are approved by the American College of Surgeons.

GLENN MYERS, M.D.
Medical Director.

Beverly Hills Sanitarium

for

The Study and Treatment of Nervous and Mental Diseases

218 No. Westmoreland DALLAS, TEXAS Telephone 9-3114

This sanitarium is a psychopathic hospital with a home-like environment and is equipped to treat psychiatric and neurological cases in a most scientific manner by means of psychotherapy, occupational therapy, recreational therapy and physiotherapy, including hyperpyrexia, insulin and metrazol treatments in special conditions.

ARTHUR J. SCHWENKENBERG, M.D.
Attending Neuropsychiatrist

ROBERT E. WINN, M.D.
Resident Physician

VOL. IV OCTOBER 1943 No. 10.

EDITORIAL OFFICES
UNIVERSITY OF TEXAS SCHOOL OF MEDICINE
800 AVENUE B., GALVESTON, TEXAS

BUSINESS OFFICES
PHYSICIANS POSTGRADUATE PRESS
500 NORTH DEARBORN ST., CHICAGO, ILLINOIS

COPYRIGHT, 1943 BY
PHYSICIANS POSTGRADUATE PRESS

DISEASES of the NERVOUS SYSTEM

(PUBLISHED MONTHLY)

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

Misfits in the Military Service*

COLONEL FRANKLIN G. EBAUGH, M.C.**
Dallas, Texas

Since World War I our government has spent over one billion dollars on neuropsychiatric cases of the last war. Each case has cost the government approximately thirty thousand dollars and from the last war's experience we estimate that a neuropsychiatric casualty is sixteen times more liable to result in a permanent disability than are other types of illness. In the thirty-three months from April 1, 1917, to December 31, 1919, 97,657 men with neuropsychiatric disorders were admitted to the military hospitals. This was regularly about 3,000 per month. At present fifty-eight per cent of the veterans' hospital beds are occupied by neuropsychiatric cases, a strikingly important figure in view of the long-term problems that result. British authors have stated that one in seven of the British casualties of World War I were neuropsychiatric cases or one in three, excluding wounded soldiers. During the great offensives the neuroses made up forty per cent of the British casualties evacuated from France. Hence, there can be no question regarding the importance of these problems in wartime—a real psychiatric emergency arose during the last great war in an army much smaller than our present combat forces. From the figures and experiences of the last war we may expect some five per cent of all draftees to show neuropsychiatric disorders sufficient to warrant rejection, for approximately two per cent of all candidates were excluded because of some neuropsychiatric disorder, while an additional three per cent were later discharged because they were found to be suffering from psychiatric or neurologic disorders.

How are we doing twenty-five years later? At one induction center rejection rates for neuropsychiatric cases average about seven and one-half per cent of all draftees. Follow-up studies on these draftees show a surprisingly low error rate, three one hundredths of one per cent; that is, a fifteen months' follow-up study of 15,300 draftees passed by this induction center revealed that there were only six neuropsychiatric discharges from this group that might be attributed to errors at induction. This is the better side of the picture. It shows that we are able to do effective work under good conditions. Needless to add, this is not true of all induction centers. Sufficient statistics have not yet accumulated from this war and we have not yet been long in mass combat, but we do have a picture of the problems from other forces.

The Canadians first began inducting an army by paying little attention to personality factors and by sending men overseas after a short training period. The results were poor. Hicks, speaking in New York in the fall of 1940, reported that sixteen per cent of the men invalided home from England since the outbreak of this war have suffered from neuropsychiatric disability and an additional twenty-six and one-half per cent had duodenal ulcers, a condition frequently associated with emotional disturbance and tension. Since

*Read before the combined meeting, Dallas County Medical Society and Texas Society for Mental Hygiene, Dallas, Texas, March 5, 1943.
**Neuropsychiatric Consultant, Eighth Service Command, Dallas, Texas.

then the viewpoint of the Canadians has changed and they are being far more careful in the induction of men for the Canadian forces.

Throughout our country, at the present time, figures of from forty to sixty per cent are given for neuropsychiatric disabilities among soldiers being discharged from the army. This is a high figure, but it must also be appreciated that the last war's experience has shown that fifty-two and six-tenths per cent of the neuropsychiatric casualties had broken down after less than one month's duty and approximately eighty-six and seven-tenths per cent had broken down by the end of six months' duty. Obviously most of these cases were hospitalized before the end of the training period and certainly before embarkation.

That brings us to the most important phase of our work, a phase where mental hygiene societies are performing valuable and loyal service—the careful induction of men fitted for the services. Recently we asked a humorous and intelligent schizophrenic why he had not told the details of his previous illness to the induction doctors. He replied, "When they fire on the flag it is time for action. I just told a terminological inexactitude!" This patient nicely worded our major need—to get adequate histories of past performance *before* induction into the service, for the experience of our psychiatrists of both wars has been that from sixty to eighty per cent of the neuropsychiatric casualties had been ill for many years before entry into the service. Eighty-four and two-tenths per cent of the neuropsychiatric casualties of the last war had histories of five or more years' duration for the illness before entering the service. Social service studies have also indicated that records were easily obtained and were clear-cut as outlines of inadequacy for the services. In a number of the induction centers in Texas we are laboring to eliminate the unstable without the benefit of histories, a task made doubly difficult without this aid. Here opportunities for service are legion.

Just what can we do to improve these conditions? How can the Mental Hygiene Society contribute to this imperative work? First you will want to know the types of persons commonly considered as unfitted for service. We might define the misfit as that person who does not have the capacity to meet or stand the stress of prolonged military experience because of structural or functional defects. The persons with medical and surgical defects will not be discussed, for we are interested today in those who are more liable to be upset than others because of personality or nervous system disorders. Probably every person, even the most stable, might crack and break under certain conditions of prolonged strain. We are well able to cope with those who temporarily show the strain of severe fighting, but we do not want the men who are much more liable to be upset than others. These, at a crisis, are a dangerous source of weakness. They not only suffer themselves, but they readily and unknowingly disturb others, for a unit in a tough position is peculiarly liable to mass suggestion. These more unstable persons have been placed in eight categories according to the regulations of The Surgeon General's Office. The following chart represents a digest of the eight groups that should not be inducted into service:

Chart I

REJECTABLE INDUCTEES

I. Persons below minimum literacy. (shown by a score of 9 in the Army Information Sheet).

Persons below minimum mentality. (shown by a score of 35 in the Visual Classification Test).

(Standards of literacy and mentality as determined by psychological tests and usually corresponding to fourth grade education level.)

II. Psychopaths having shown persistent misbehavior or a poor work record.

III. Inductee previously hospitalized for a mood disorder or one who shows evidence of markedly impaired judgment during mood swings.

IV. Psychoneurotics showing any of the following patterns:

a) Inefficiency in work or school.

b) Long periods of inactivity or hospitalization.

c) Excessive drifting from place to place, job to job, or doctor to doctor.

V. Pre-psychotics, post-psychotics or schizophrenics presenting:

a) A previous history of psychiatric hos-

pitalization.

b) A definite picture of oddness or peculiarity after a three to six minute examination.

VI. Alcoholics showing any of the following:

a) Excessive drinking resulting in the loss of jobs.

b) Repeated arrests.

c) Reliable history of hospitalization for excessive drinking.

Narcotic and sedative addicts.

VII. Persons with any type of syphilis of the nervous system.

VIII. Inductees showing an *existent* organic disease of the brain, spinal cord or peripheral nerves.

Inductees showing residual defects from nervous system disease that would prevent moderately efficient day to day work and a regular routine of living.

Cases giving a reliable history of convulsions, fainting, treatment for epilepsy, "black outs," "fits," spasms, or "falling out spells," regardless of etiology.

When in doubt, *delay induction* for more complete records or a period of army hospitalization and observation. This applies to any of the eight categories.

This outline gives a quick review of the types undesirable for military duty. How are we to go about getting sufficient information on these fellows? How can the Mental Hygiene Society help to provide this information, for it should be obvious that we cannot detect many of these categories without a reliable history? Chart II presents a tentative outline of a plan that might be of service in Texas. The large area of this state and the isolation of many communities contribute to our difficulties, but under an able central organization these problems could be satisfactorily handled. In areas lacking in skilled social service help we could utilize the better teachers, as has been done so well in Maryland. We should provide a standardized history outline and guide to interviewing for the untrained helpers and we should have sufficient secretarial help in the central agencies so that the lists of future inductees may be processed and

Chart II

PLAN FOR COLLECTING SOCIAL SERVICE DATA ON SELECTEES

Local Social Service Groups	*Prisons, Courts, Hospitals*	*Schools and Industry*
Check old records and collect social service data.	Check records against lists of inductees and report findings.	Report school, work and personal facts.

↓

Return records to central agencies

↓

Local Selective Service Boards
(append records to S. S. form 221)

↓

Induction Centers
(Receive augmented records before the induction date for the inductee)

Central groups (confidential exchanges, local committees) under the control of a coordinator might serve well as agencies for the completion of the records. In areas where skilled workers are not available it may be possible to utilize the skilled help of the Federal social security or relief groups. Teachers and Red Cross home service workers have proven effective in gathering short social service records, particularly in more remote areas.

sent to the local fact-finding agencies; and so that the incoming information is collected under the proper names and sent to the proper local boards. This work would be of immeasurable value to our induction center examiners.

With such help, a conservative estimate might be that we could eliminate thirty to forty per cent of the potential neuropsychiatric load. We are planning on the elimination of less than this figure and have already set up psychiatric services in replacement training centers; that is, those centers where the soldiers go for basic training after they have been inducted and have spent several days in reception centers where they have been classified and tested to determine the right placement and right service for each soldier. In the replacement training centers we have a great opportunity for excellent preventive mental hygiene work, besides our obvious duty to eliminate the unstable that have not been rejected by the induction centers. The following chart presents a brief outline of the major tasks of the replacement training center neuropsychiatrist:

Chart III

NEUROPSYCHIATRIC FUNCTIONS AT A REPLACEMENT TRAINING CENTER

1. Consultation services for other medical officers, psychiatrist, psychologist, and psychiatric social service worker.
2. Out-patient clinic:
   a) Treatment and diagnosis for ambulatory cases.
   b) Center for selection of patients for rehabilitation unit.
3. Rehabilitation unit, under out-patient and hospital services.
4. Cooperation with Judge Advocates and the military police to facilitate examination of disciplinary cases.
5. Membership on Officer Candidate and Section VIII Boards (inaptitude).
6. Arrange and facilitate close cooperation with classification, personnel, psychological, social service and Chaplain's units. Preferable to have a psychologist and psychiatric social worker as staff members.
7. Improve methods of observation and insight by the training and education of key line officers and Chaplains (informally).
8. Cooperate with Special Services in planning talks to troops on fear, discipline, sex behavior, aims of the war, drinking, recreation, fatigue, anxiety, officer-soldier relationships, etc. This psychological toughening and education of the troops is a very important phase of the work.

Of course the effectiveness of this program will largely depend upon the skill and personality of the neuropsychiatric officers as well as the psychologist and psychiatric social service worker. We have been fortunate in the selection of these officers and this phase of our work is progressing. A common example of effective work in replacement training centers would be the treatment of homesickness. Homesickness is revealed by two main patterns. One group develops a reactive depression and is usually aware of the origin of this disturbance. Another group, occasionally confused with schizophrenia or feeblemindedness, consists of service men who appear apathetic and preoccupied. There is no obvious emotional disturbance, and although these men appear satisfied with their lot they are continually thinking of home and have little or no insight into how these trends disturb their adjustment. These men appear to be absentminded, vague, slow, inefficient, careless, untidy, and generally unreliable. The fictitious lack of contact and fictitious apathy may be confused with schizophrenia. The difficulties in concentration and learning may be mistaken for feeblemindedness, particularly because there may be a low score on the intelligence test. However, the individual test frequently shows a wide scatter, with difficult problems well done and simple tasks poorly done. Again the school record is incompatible with the diagnosis of feeblemindedness. Fortunately both of these reactions are relatively benign and one interview is usually sufficient to correct this problem of homesickness. It is pointed out to the patients that this continual immersion in matters to do with home has resulted in a poor efficiency and these men uniformly exhibit a better adjustment after a few such interviews.

At the present time, in hospital units in the

United States, our aim is to return most of the neuropsychiatric patients to civilian treatment agencies as soon as board proceedings and adequate studies have been completed. As stated before, most of the present flow of cases represent chronic reactions that have been present long prior to military service. In doing this we are meeting with some resistance from state authorities and families who unjustly think that these cases should be the responsibility of the service and they refuse to take the cases. Of course, this is also partially determined by over-crowded conditions in some state hospitals. However, the mental hygiene societies should attempt to stimulate more rapid discharge of chronic state hospital cases or institute a program of supervised home and farm placement for the less disturbed cases so that room will be made for the acute and often dangerous individuals awaiting admission.

The case of a very sick schizophrenic comes to mind. He is now working in an arsenal and has been working at this arsenal for the five or six months since his discharge from an army hospital. Before the war he rarely worked and he volunteered for service to get his memory back (E19). His present employer understands that he is odd, but the dire need for help has forced the employer to overlook the man's oddity and he is employed at a position where he will not be forced into contact with other workers. This individual is still as sick as when he was discharged from the service, but he is managing to hold a position at approximately two hundred dollars a month. This case illustrates that many unstable persons are now working in industry, persons who would not have been tolerated in peacetime. Much of the present problem of absenteeism is related to these problems rather than the columnists' ideas about lack of patriotism and so forth.

The clinical picture of psychotics in military service is similar to civilian cases, except for a large group of very explosive paranoid and catatonic reactions which appear to subside in twenty-four to forty-eight hours. Although these cases appear to be socially well adjusted they still show many defects upon Rorschach study months after the original acute episode. Thus, we are having the unique experience of seeing the fleeting and acute disorders that herald a more chronic state and that are rarely seen in civilian practice, except in retrospect. Large numbers of psychopaths drift on in the service as delinquents who make up the chronic guard house cases. Feebleminded persons are being pretty well weeded out by the psychological tests. Some of these feebleminded soldiers can be reclassified and utilized in the area of the interior for carrying out many of the routine maintenance tasks.

The psychoneurotic reactions and psychosomatic states are proving to be the larger problems. Here, early treatment of the acute neurotic states has been very successful. A number of officers report a sixty-five to seventy per cent return to duty with very few relapses after active treatment during the first two weeks of the acute disorder. These cases are usually seen in battle areas, for example, after Dunkirk. Rest, sedation, recovery of the material of the amnesic period with or without the use of amytal or hypnosis, and reassurance have been the mainstays of the therapy; for the therapy is primarily designed to return the man to duty within two weeks at the most. These cases represent acute medical emergencies that are best treated in the battle area. Very soon the disorders become fixed if they are evacuated to various hospital units behind the active front. In fact, six weeks of hospitalization on a medical ward of a fixed hospital unit will often serve to congeal the pattern. The most important problem of the British medical service is "stress dyspepsia" and there is a controversy raging about the etiological factors out of which will come a much better understanding of the psychosomatics of gastrointestinal disorders. The cooperative medical, psychiatric, and surgical care of head injury cases in England has markedly changed our concepts of treatment. Sixty-five to seventy per cent of the post-traumatic head states present symptoms predominantly psychological. These head cases are uniformly gotten out of bed within a week of recovery of consciousness and they are primarily treated from a psychosomatic viewpoint from the time of the head trauma. The results are promising and we are getting many more of these men back to duty. Time does not allow for the discussion of the very interesting work with cases showing an inability to tolerate effort, the neurocirculatory asthenia or disordered action

of the heart. Psychosomatic medicine is receiving a vital stimulus in these times and there is a rapidly growing field of fact relating to these states. Without a doubt these are some of the more outstanding contributions from war medicine. Terms like "shell shock," "low back disease," "effort syndrome," etc., are rarely applied to cases of this war but are supplanted by more dynamic etiological diagnoses and a concurrent more enlightened and successful treatment program is offered. In other words, our emphasis on the total functions of the person is paying rich dividends in the combat areas, particularly in some of the English treatment centers.

Morale of the civilian and fighting units of a country has assumed greater significance in total war and it is interesting that civilian psychiatric disorders are less common than those in the service in the British Isles. This has not been satisfactorily explained and some of us are not inclined to recommend bombing as a mental hygiene measure as some of our British colleagues seem to imply. Briefly we might list the important morale control measures from the individual and group viewpoints as follows:

Chart IV

MORALE CONTROL MEASURES

I. *Individual methods of control:*
   a) Physical fitness.
   b) Adequate nutrition.
   c) Prevent fatigue (sleep, recreation, planned activity).
   d) Emphasize positive and pivotal life values:
      Regular and satisfying work.
      Adequate social life.
      Adequate family life (home, wife, children, etc.)

II. *Group methods of control:*
   a) Increased group activity (church, school, home). Security in common aims and common dangers.
   b) Good leadership. (Avoid the chronic complainers and continually suspicious.)
   c) Group education about the war and ideals of the country.
   d) Central organization (Office of Civilian Defense, etc.)
   e) Ground rumors (rumor clinics, newspaper articles).
   f) Disregard enemy threats.
      Counter propaganda.
      Analysis of threats.
   g) Combat idleness and boredom.
      Small local defense groups with active leadership.

Mental hygiene societies have the opportunity to direct discussion of morale factors. It would be well to follow the excellent outlines for talks provided by the Office of Civilian Defense; The American Psychiatric Association; the New York, Illinois, Massachusetts, and National Mental Hygiene Societies. In fact, attempts should be made to give talks to groups on topics outlined by the morale committees of these organizations. The mental hygiene societies are taking the leadership in following out programs similar to this for the need has arisen out of our better appreciation of German psychological warfare and the need to actively counteract years of propaganda which has left its mark.

In closing it will be well to review the measures open to the mental hygiene societies—measures contributing to a better conduct of the war and a better approach to the problems of our postwar world when we win—which should be in the near future, we hope.

Chart V

FIVE MENTAL HYGIENE GOALS IN WARTIME

1. Active aid in collecting past records on inductees.
2. Stimulate cooperation with the services in taking responsibility for rejected candidates and discharged soldiers.
3. Continued and active education of civilian groups in morale factors, psychiatric facts, and the better understanding of mental hygiene aims in wartime.
4. Stimulation of legislation and planning toward reconstruction centers and special convalescent corps for war casualties (neurotics, head injury cases, partially deaf or blind, etc.) and many state hospital cases.
5. Stimulate planning for postwar problems of compensation, veterans' care, social change, and the social applications of our knowledge of individual behavior.

Myasthenia Gravis and Curare Sensitivity*

A. E. BENNETT, M.D.**
Omaha, Nebraska
and
CAPT. PAUL T. CASH, M.C.***
U. S. Army

From the very beginning of our work with standardized curare we have pointed out that the action of curare closely resembles the symptoms of myasthenia gravis. Other investigators have made like observations. We found that Oppenheim as early as 1901 had noted the similarity.

In 1940, Harvey and his associates confirmed the similarity, stating: "The characteristic abnormalities of the electrical responses of the myasthenic and curarized muscle are identical in all respects." After reviewing the extensive experimental work which points to the similarity of myasthenia to a mild curarization, they concluded that the defect in the disease, as in curarization is very likely due to "an elevation of the threshold of the motor end plates to the effects of the nerve impulses reaching them."

Myasthenia gravis was described in 1865 by Wills, but not until 1895 was it named myasthenia gravis by Jolly. Principal symptoms and signs of the disease include fatigue of muscles, appearing at the outset in the eyes, face, mouth, throat and neck. Ptosis, diplopia, and nasal husky speech accompany these signs. Remissions occur in the first stages, with temporary improvement from rest. In later stages weakness of extremities, loss of speech, difficult mastication, difficulty in swallowing and choking spells occur.

Diagnosis has been based on clinical signs and on electrical and chemical tests.

Clinical signs, as noted above, are the myasthenic facies (ptosis), nasal smile, rapid fatigue of eye muscles, extraocular palsies and weakness of jaws and of neck muscles.

In the electrical test, faradic stimulation should produce the Jolly reaction, i.e., rapid fatigue of muscles. Harvey and Masland found that in myasthenia gravis or curarization, supra maximal stimuli in either a single impulse or train of impulses were followed by a decline in muscle action potential.

The diagnostic (Viets and Schwab) chemical test is prostigmine methylsulfate (1.5 mg.) and atropine sulfate (1/100 gr.) given intramuscularly. Objective and subjective improvement in the symptoms of the patient are graded from 1 to 4 at 10-minute intervals over a one-hour period. A total score of 8 or less is negative; 8 to 18 is doubtful; and 18 to 48 is positive presumptive evidence of myasthenia gravis. About two-thirds of patients with the disease show this positive chemical test.

Curare Sensitivity as a Diagnostic Test

The evidence leading to the use of sensitivity to curare as a diagnostic test is extremely complex and will be described only briefly. A longer and more technical explanation has been published elsewhere.[1]

In myasthenia gravis the transmission of nerve impulses across the myoneural junction is interfered with. Acetylcholine, the normal chemical mediator of neuromuscular transmission, must therefore be faulty in action.

Experimental evidence shows that curare inhibits the action of acetylcholine. Very small amounts of curare seem to alter the threshold of muscle response to acetylcholine, thus inhibiting muscular action. Some evidence also shows additional primary disturbance in muscle metabolism, such as a decided increase in potassium in myasthenic muscles, a smaller consumption of oxygen and faulty creatine metabolism.

Curarization produces all the signs of myasthenia gravis. Increased doses of curare elicit symptoms progressing through the same steps seen in mild, moderate, and advanced stages of the disease; and produce an artificial myasthenia clinically indistinguishable from the disease. From this fact it seems that some substance similar in action to curare causes myasthenia by inhibiting or altering the action of acetylcholine and thus interfering with the transmission of nerve impulses at

*A specific diagnostic test, with new suggestions as to etiology.

**Head of Fever Therapy Research Department, Clarkson Memorial Hospital, Omaha, Neb.

***In the United States Armed Forces. Captain, Medical Corps.

the myoneural junction. The myasthenic patient would then be highly sensitive to small additional amounts of curare. This was found to be true.

As noted above, in about one-third of cases of myasthenia, the prostigmine diagnostic test is not positive. It is in these cases that the specific response of a minute injection of curare, which exaggerates the symptoms or produces new ones, is one hundred per cent effective.

In 10 cases of myasthenia at different stages of the disease, 1/20 to 1/10 the average dose of standardized curare[2] necessary to produce generalized paresis in the normal adult caused profound exaggeration of symptoms. From these observations we have concluded that curare is a safe and specific diagnostic test for myasthenia gravis; and that in doubtful cases which show an indefinite response to prostigmine curare will produce a more specific reaction.

Technique of Curare Diagnostic Test

Intravenous administration of about 1 mg. of standardized curare[2] per kilogram of body weight produces mild generalized curarization in the normal adult. In the doubtful case of myasthenia, 1/20 of this estimated physiologic dose, injected intravenously over a one-minute period, produces a peak reaction within two minutes.

Aggravation of existing myasthenia symptoms, particularly paralysis of the oculomotor muscles, weakness of the facial muscles and tongue and dysarthria and dysphagia are positive signs of myasthenia. New symptoms, such as flaccid paresis of the neck and extremities, may appear. Respiration may become labored and the patient may be unable to talk or protrude the tongue.

Within two to three minutes the test should be terminated by intravenous injection of 1.5 mg. of prostigmine methylsulfate with 1/100 grain of atropine sulfate. All acute effects of curare disappear within one minute together with myasthenic symptoms if the patient is reactive to prostigmine. *Without prostigmine,*[3] the test would be dangerous.

Doses up to one-fifth the physiologic dose may be given, but are unnecessary for diagnosis. We have found the test positive in one-

REPORT OF FIVE CASES

Case	*Symptoms and Findings*	*Prostigmin Test*	*Curare Test*	*Remarks*
1. F. age 31	Remitting ptosis, diplopia, dysarthria, 3 yrs. duration. Weight 100, oculo motor facial, bulbar findings.	4 plus score	5 mg. produced complete ptosis, opthalmoplegia, general paresis; relieved by prostigmin.	
2. M. age 54	Recurrent ptosis and opthalmoplegia sl. bulbar, 10 yrs. dur. Complete ext. opthalmoplegia. Left exopthalmus, weight 160.	doubtful	8 mg. complete oculofacial, bulbar paresis, generalized flaccidity; only curare symptoms relieved by prostigmine.	No relief from prostigmine, ephedrine, guanadine or cortin. Thymectomy, death.
3. M. age 74	Remitting ptosis, diplopia, dysarthria, 3 yrs. duration. Weight 140, partial oculo motor facial bulbar signs.	4 plus score	7 mg. complete oculofacial bulbar paresis and generalized flaccidity; all symptoms relieved by prostigmine.	Able to continue full occupation upon oral prostigmine.
4. M. age 56	Partial remitting left ptosis, one month duration. Weight 197, sl. rt. ptosis, more complete left ptosis.	not done	10 mg. marked bilateral ptosis and facial weakness; all symptoms relieved by prostigmine.	Very early case, curare test confirms diagnosis.
5. F. age 37	Progressive fatigability of extremities, 18 yrs. duration. No ocular or bulbar symptoms. Weight 124, sl. facial weakness.	not done	4 mg. bilateral ptosis, opthalmoplegia, bulbar paresis and generalized flaccidity; prompt relief of all symptoms by prostigmine.	Curare supplied all classical missing myasthenic symptoms.

fortieth the physiologic dose and have decided one-twentieth is the most suitable. The physiologic dose in a myasthenic patient would probably be fatal in the absence of artificial respiration and administration of prostigmine.[3]

Comment

Patient number 2 gave indifferent response to the diagnostic prostigmine test and received no relief from drug therapy. In patient number 4 the curare test enabled immediate diagnosis of a very early case of myasthenia gravis. In patient number 5 the curare test immediately brought out all the missing symptoms and clinched the diagnosis of a case in which myasthenic symptoms for 12 years had been confined to the muscles of the larger limbs. Patients 1 and 3 gave strongly positive diagnostic reactions to prostigmine; the former was severely disabled with myasthenia; the latter had a mild case completely controlled by prostigmine.

In all patients, 1/10 the physiologic dose of curare produced profound exaggeration of myasthenic symptoms. In our later cases we have used 1/20th the physiologic dose. The test is very valuable in ruling out suspected myasthenia in asthenic states such as postencephalitis, psychoneurosis, etc. In such conditions the curare test quickly proves the case is not myasthenia—no symptoms of curarization develop.

Treatment

Therapy is mostly symptomatic and palliative. Prostigmine, ephedrine, glycine, lecithin, potassium, chloride, and guanidine hydrochloride are used. Radiation of the thymus gland and thymectomy benefit a few. Remissions often occur with pregnancy.

New Clues to Etiology

These findings suggest some form of curare intoxication as the etiologic agent in myasthenia gravis.

Possibly overactivity of the thymus gland may produce a substance with curare-like action. Evidence is the fairly constant pathologic findings in the thymus at necropsy; the relief of myasthenia by irradiation of the thymus or thymectomy; some observations in experimental thymus gland transplants; and mild myasthenias occurring in cases of exophthalamic goiter, in which the thymus gland is known to hypertrophy.

The source of the causative agent, which is a quaternary ammonium base compound, must be sought for in the human body to explain the origin of the rapid fatigue of muscle that characterizes the disease.

At any rate, sensitivity to curare suggests a chemical factor of similar action, as the cause of myasthenia gravis. Future studies of the causal agent should be directed to finding some neurophysiologic or biochemical factor of curare-like action.

Summary

1) Some failure in acetylcholine action apparently exists in myasthenia gravis.

2) Physostigmine restores neuromuscular action in most myasthenic patients.

3) Curare changes acetylcholine action and produces artificial myasthenia.

4) A primary muscle disorder apart from neuromuscular block may also occur in certain stages of the disease; experimental evidence has not been confirmed.

5) The myasthenic patient shows a marked sensitivity to curare. Injection of one-tenth to one-twentieth the usual physiologic dose produces profound exacerbation of existing symptoms and may add new ones.

6) This sensitivity gives a specific diagnostic test for the disease.

7) A new approach to causation is suggested by this test. The source of the causal agent, possibly a quaternary ammonium base compound, is a subject for future investigation.

References

1 "Myasthenia Gravis," *Arch. Neurol. & Psych.*, 49: 537, (April) 1943.

2 Standard curare prepared by E. R. Squibb & Sons, New York, N. Y., under product name "Intocostrin."

3 The authors are indebted to E. R. Squibb & Sons for "Intocostrin" used in these studies.

The Treatment of Various Depressive States by Electric Shock

(Analysis of 133 Consecutive Cases)

LEWIS A. GOLDEN, M.D.*
New Orleans, Louisiana

Every medical man encounters a large number of patients who have been ill, often for a long time, from a condition which is commonly known as a depression. In many cases, this disease is obvious. The patient cannot sleep, is exhausted, feels dull and foggy, and has lost interest in food, friends and work. Every day seems like a month; he feels that he is a failure. His movements and gait are slow and his thinking retarded. Whether such a depression is in response to a personal calamity, failure in work, loss of savings, a severe illness, or the death of a loved one, it is not sufficient to say that the reasons for the depression are apparent and to confine treatment to a slap on the back and the cheerful statement, "You'll soon snap out of it."

Unfortunately, these depressions are serious; they may lead to broken homes, unwise decisions, or even suicide. Furthermore, they may last from six months to two years or longer. The depression may be a recurrent one, that is, part of the manic-depressive psychosis which each year afflicts several hundred thousand people in this country. Depression may occur in the involutional period, may follow the menopause or may be a part of it, or may appear late in life as part of an organic arteriosclerotic change in the brain, or as part of a senile psychosis. Regardless of the cause, the depression must be recognized and treated. When we see a patient with pneumonia, we do not care whether he contracted it by falling in the gutter or by standing in the rain. Although it is extremely helpful to recognize whether a depression is part of a manic-depressive psychosis or is a reactive depression in response to some grievous personal loss, we are still faced with the fact that a depression is a mental reaction which is extremely miserable to the patient, is exceedingly expensive, runs a long course, and may lead to many unpleasant complications. Many depressions tend to resolve themselves. The cure is often attributed to whatever the physician is doing for the patient, to the removal of some mild focus of infection, to a trip to the country or to any other measure that happens to be employed. Careful study of such patients reveals that they get well when the depression has run its course regardless of the treatment. Most depressions tend to be self-limited and usually disappear simply with intelligent supervision.

The problem of the practitioner, however, is not recognition of the obvious depression, but recognition of depressive states which mask themselves in various complaints referable to the abdomen, heart or throat, as well as in numerous other subjective feelings which bring a patient with a mild depression to the clinician. These patients continue for months trying one medicine after another without obtaining any appreciable relief and without being recognized as essentially cases of depression. These are the cases that it is most important to recognize. They are legion. Now there is a promising and helpful specific treatment which can terminate over 85 per cent of all types of depression within four weeks, thus saving many months and sometimes years of misery, expense and family disruption. This treatment is electric shock therapy. It is a striking fact that although electric shock therapy was first employed for the treatment of schizophrenia, the most unusual results have been obtained in cases of depressions, particularly the manic-depressive, agitated, involutional and reactive groups. Permanent remissions are being achieved in over 80 per cent of cases of mental depression of all types.

Recognized and properly treated, the course of such an illness may be reduced from years or months to perhaps a few weeks. The following cases are typical records of patients suffering from depressive states.

Report of Cases

Case 1—Mrs. O. J. L., aged 68, was first seen

*Assistant Professor of Medicine in Neuropsychiatry, Tulane University School of Medicine, and Consultant in Psychiatry and Neurology, Ochsner Clinic, New Orleans.

in the office Oct. 10, 1942, complaining of loss of weight, anorexia, despondency, insomnia, pain over the precordium and indigestion.

The patient had always been vigorous and active although she was inclined toward solitude. She had had no formal education. She lived on a farm, which she managed with the aid of a helper, and seemed to enjoy this type of work. The death of her husband in January, 1942, was a severe shock to her. Following this she went to live with her daughter. She was financially dependent upon her farm which, however, had been unproductive the past summer. Consequently, she worried considerably over her financial dilemma. About six weeks before she came to the office her sons stated that "she had coughed up entirely." She became extremely moody, refused to eat, lost ten to fifteen pounds, could not sleep and remained in bed all day. She had no desire to live, was convinced she would never be well and begged piteously to be sent to an institution. The menopause occurred at the age of 46 and she experienced no difficulty during that time. There was no bleeding except for a slight vaginal discharge.

Mentally, she was depressed, melancholy and somewhat confused. She kept repeating in monotonous tones, "Put me away. No one can do anything for me. I am gone." This was accompanied by wringing her hands in great agitation. Physical examination was normal except for slight enlargement of the heart, soft systolic murmurs at the apex and accentuated second aortic sounds.

Much against her wish she was placed in the hospital where she proved difficult to manage. She was given electric shock therapy every third day. Ten days after the first electric shock treatment, there was an obvious change in her condition. She began to eat spontaneously, slept well, was cheerful, and walked about the ward chatting with the other patients. When asked how she felt, she responded, "Fine. I want to go home."

Comment—This is a case of an agitated depression in a 68-year-old woman. The condition appeared to be due to inability of the patient to adjust herself to recent events. The normal personality of the patient was restored within twelve days by means of shock therapy. Without this type of treatment, the course of the disease may have run for many months or years or may have terminated fatally.

Case 2—Mrs. G. S., aged 38, was first seen in my office on Sept. 30, 1942, because of pain in the neck and inability to move it, "clicking noises" in the ears, vague pains in the shoulder, and occasional low grade fever of about a year and a half's duration.

The patient had been examined repeatedly for these complaints, but no organic disease could be found. On March 5, 1942, upon turning her neck quickly to one side, she experienced such an excruciating pain that she was hardly able to move her neck at all. Six osteopathic treatments gave no relief. She complained bitterly of increasing discomfort in the neck and nervousness. A few weeks later she was treated for pharyngitis. Gradually, the pain in her neck and shoulders disappeared.

Physical examination revealed hypertensive vascular disease. The blood pressure was 175/110. She was seen by an orthopedist because of continued complaints of "creaking" in her neck, by an otologist, for the clicking noise in her ears, and by a urologist for urinary frequency. The basal metabolic rate was normal (ranging from +4 to +11). The Kline and Wassermann reactions as well as urinalysis were negative. There was no evidence of myocardial disease. Roentgenograms of the chest and cervical spine were negative. Despite the fact that no organic disease could be found, she continued to complain and was then referred to me.

She was tense, nervous and apprehensive; in relating her ailments she spoke with a quiver in her voice as if about to cry. She rapidly recited a long, detailed history of nervousness, tension, difficulty in concentration, apprehension, insomnia and irritability. She had been a healthy child but unhappy because her father and mother were separated. Three years before I saw her, she moved from a small town, where her prime interest was her home, to a city where she concentrated all her efforts on club activities. She was given a great deal of responsibility and overworked in order to perform her duties perfectly. She is the mother of two children, and when she was anxious and concerned about her club activities they annoyed her considerably. She was primarily obsessed with the fear of losing her mind, and consequently she was becoming a "nervous wreck." Neurologic examination revealed no abnormalities.

The patient was given electric shock treatments for two weeks, resulting in immediate improvement. She no longer heard the noises, became more relaxed, and slept better. Her confidence was restored, and two months following treatment she appeared normal. Her blood pressure has fallen to 137/93.

Comment—This case is one of a depression which is so well masked that the patient was referred to many types of specialists before she was sent to the psychiatrist. Persistent direct questioning was required to diagnose the case.

Case 3—Mrs. V. A., aged 32, the wife of a physician, was suffering from abdominal pain, nausea, vomiting, fatigue and nervousness of five years' duration.

The patient had always been well, but never robust. She gave a history of numerous headaches, and there was a family history of allergy and headaches. At college she had been quite healthy and was regarded as a natural leader, vigorous and full of confidence. In 1936 her first child was born dead, the cord tied around its neck. Following this she became melancholy and nervous. Her second child, born two years later, was normal. She was extremely ill during the pregnancy with considerable nausea and vomiting. She began to complain of active pain in the upper left quadrant and required much medication. She was given intravenous injections for the frequent nausea and vomiting. Migrainous headaches became numerous and intolerable. She cried often and spoke of suicide. In 1938 alternating diarrhea and constipation of moderate degree were noted, the diarrhea being accompanied by a fair amount of mucus and associated with pain in the abdomen. She lost interest in food and ten to fifteen pounds in weight. Urination was frequent but not painful. Most of the last three years were spent in bed, and she complained bitterly of painful menstruation, backache, and nervousness. The allergic history was confusing, as her husband stated that she reacted violently to injections of thiamine chloride and other foods were suspected. There were numerous other somatic complaints difficult to evaluate. She had had no comfortable intervals of longer than two or three weeks during the past five years.

Physical examination was essentially negative. Complete laboratory studies, including roentgenographic examination, stool cultures, febrile antigens, kidney function test and intestinal tract rays, were all normal. Psychiatric consultation resulted in the diagnosis of masked depression with many psychosomatic symptoms.

Electric shock therapy had to be urged. The patient received eight electric shock treatments over a period of three weeks. After the third treatment, the depression lifted. She stopped complaining, seemed calmer and was anxious to leave the hospital. On discharge her family thought that her pre-depressive personality had been restored.

Comment—This patient has been out now for several months, and her family, among whom there are several physicians, states that she feels like a different person. This was a very difficult, trying case, and although it was evident to everyone that she was nervous, the fact that there was a pronounced masked depression operating in her illness was not clearly recognized. The response to electric shock therapy is concrete evidence of the truth of this assertion. This case illustrates that, regardless of the duration of the illness, it is possible to benefit such patients greatly.

Case 4—Mr. W. R. P., aged 39, stated that he had been suffering from pain in the leg on walking for six or seven years. A sympathectomy was performed on Aug. 31, 1942, to improve circulation in the leg followed by a good immediate result. However, two and a half months following operation, he returned stating that his legs were again causing him pain.

Orthopedic examination by Dr. Guy A. Caldwell at this time revealed no abnormalities other than mild arch strain and some functional disturbance manifested by inconsistency in control of the muscles in his legs. Roentgenograms of the knees and ankles were essentially negative. In spite of negative physical findings, he continued to suffer. He was then referred to me.

On Dec. 19, 1942, when I saw him, he was still complaining of pain in his legs, but persistent interrogation revealed that he was also nervous and had been unable to sleep. Closer questioning elicited obvious evidence of sadness, loss of interest in food, friends and sexual relations, insomnia, aggravation of aches and pains, occasional tremors, fainting, fear of walking and a definite feeling

that life was not worthwhile with consequent contemplation of suicide. It was apparent that this patient was suffering from a depression in addition to the organic difficulty in his legs.

He was hospitalized and given six electric shock treatments, after which his mental condition was restored to normal. He appeared to be happy and cheerful and eager to resume his normal routine. He admitted that he felt better than he had in years. A few months after he was discharged from the hospital his wife wrote that he felt fine, and that his disposition had improved considerably.

Comment—Here there was a depression concealed because of prominence of symptoms ascribed to the circulatory difficulty in the patient's legs. Only persistent and direct questioning revealed the presence of the depression.

The treatment of mental diseases by the production of shock has long been known. Numerous shock inducing drugs have been employed since Paracelsus introduced camphor in the sixteenth century. Among these are triazol, coria myrtin, nitrous oxide, picrotoxin, ammonium chloride and tutin. In the present century the agents used in the production of shock have been primarily reduced to three: insulin, metrazol and electricity. Rennie[1] in an excellent discussion of shock treatment has enumerated the advantages and disadvantages of each of these agents.

Electric shock therapy has been found to be preferable to insulin or metrazol for several reasons. Unconsciousness occurs almost immediately following electric induction of shock and there is total amnesia throughout the treatment, whereas metrazol causes the patient to experience an initial horrible feeling of impending death. By the electric shock method a convulsion can always be produced and if a complete convulsion is not produced, there is no undue excitement. Fewer complications follow electric shock than when metrazol is used. This is attested by the fact that no serious complications have resulted from 14,000 convulsions reported by foreign and American observers.[2] I have been present during the production of 4,000 convulsions by the electric shock method with no deleterious effects. Electrically produced convulsions are usually less violent and of shorter duration than convulsions produced by other methods.

That electric shock therapy is not a formidable procedure is suggested in the following comment made by Stewart:[2] "Experimental work on animals has indicated that passage of electricity through the brain does not produce damage. It has also been observed in animals that death due to electric shock occurs only when the current passes through the heart. In a recent survey of electro-shock therapy it was reported that two shocks of 120 volts each were given to a patient in rapid succession, one-fourth of a second apart to produce a grand mal attack. This indicates that relatively large doses of electricity can be passed through the brain with safety."

However, these remarks should not be interpreted as an attempt to minimize the hazards of shock therapy. Pulmonary edema and embolism have been reported following insulin shock for schizophrenia.[3] Shock therapy involves definite risks which must be recognized. The following conditions are contraindications to its use: heart disease, tuberculosis, malignancy, arteriosclerosis, disease of bone, a history of coronary occlusion, angina or convulsive disorder, severe anemia, organic disease of the nervous system or lungs, and disease of the liver or kidney. It cannot be too strongly emphasized that cases should be carefully selected for shock treatment.

The tables accompanying this article are an analysis of 100 consecutive cases of depressions and 33 cases of psychoneuroses. The patients were studied from the standpoint of age, sex, duration of illness and result of treatment. The number of psychoneurotic cases is too small from which to draw any valid conclusions. However, a study of the cases of depression reveals a few significant facts. The uniformly good results (86 of 100 patients improved) following electro-shock treatment of cases of depression are impressive. Only 6 of the 100 patients received no benefit from the treatment. The response of the agitated and of the reactively depressed patients was particularly gratifying. The depressed or manic episode of the manic-depressive psychosis can be satisfactorily terminated in most cases. More than half (51) of the patients were older than 50 years. Of these, 18 were between 60 and 80 years of age. It is most encouraging to know that the prognosis following electro-shock treatment in these older patients is so good.

Summary

1) The importance of recognizing depressive states which mask themselves in various objective and subjective complaints is emphasized.

2) Four cases of depression are reported in detail to illustrate the various types.

3) The course of mental depressions, once recognized and treated by electric shock, can be reduced from years to months, and perhaps weeks.

4) The contraindications of electric shock therapy are enumerated.

5) One hundred consecutive cases of depression and 33 cases of psychoneuroses are analyzed from the standpoint of age, sex, duration of illness and result of treatment. Eighty-six of the 100 patients suffering from depressive states were improved following electric shock therapy.

References

1 Rennie, T. A. C.: "The Present Status of Shock Therapy," (*In press.*)

2 Stewart, B.: "Present Status of Shock Therapy in Neuropsychiatry with Special Reference to Prevention of Complications," *Bull. Menninger Clin.*, 6: 15-27, (Jan.) 1942.

3 Nielsen, J. M.; Ingham, S. D., and von Hagen, K. O.: "Pulmonary Edema and Embolism as Complications of Insulin Shock in the Treatment of Schizophrenia," *J. A. M. A.*, 111: 2455-2458, (Dec.) 1938.

TABLE I

Type	Cases	Sex		Age							Duration							Results		
Depressions		Male	Female	10-19	20-29	30-39	40-49	50-59	60-69	70-80	6 mos. or less	6 mos. to 1 yr.	1 to 2 yr.	2 to 5 yr.	5 to 10 yr.	10 yr. or over	Recurrent	Imp.	Unimp.	Relapsed
Manic-depressive (depressed)	14	4	10		1	3	2	6	1	1		1	2	3	1	1	6	13	1	3
Manic-depressive (manic)	3	1	2	1	1	1					3							3		
Agitated depression (involutional)	45	12	33		1	3	5	23	10	3	11	9	8	14	1	2		41	4	4
Reactive depression	30	11	19	1	8	12	6	3			8	6	7	7	1	1		30		1
Pre-senile psychosis with depression	3	1	2							3		1	1	1				3		
Recurring depression (obsessive thinking)	1		1			1							1					1		
Psychoneurosis (lifelong inadequacy feelings)	1		1		1											1			1	
Reactive depression, hysterical torticollis	1		1					1					1					1		
Chronic invalid reaction	1		1				1										1	1		
Depression—chronic alcoholism	1		1				1						1					1		
TOTAL	100	29	71	2	12	20	15	33	11	7	22	17	21	25	3	5	7	94	6	8

TABLE II

Type	Cases	Sex		Age							Duration							Results		
Depressions		Male	Female	10-19	20-29	30-39	40-49	50-59	60-69	70-80	6 mos. or less	6 mos. to 1 yr.	1 to 2 yr.	2 to 5 yr.	5 to 10 yr.	10 yr. or over	Recurrent	Imp.	Unimp.	Relapsed
Schizophrenia	24	8	16	2	9	3	4	6			6		3	5	5	4	1	10	14	6
Post-puerperal psychoses	4		4		2	2					3	1						3	1	1
Psychopathic personality with depression	4	2	2		1	2	1				1	1		1		1		3	1	
Hysteria	1		1		1						1							1		
TOTAL	33	10	23	2	13	7	5	6			11	2	3	6	5	5	1	17	16	7

Subdural Hematoma in Children

M. G. PETERMAN, M.D.*
Milwaukee, Wisconsin

Subdural hematoma is not a rarity in infants and children. An accident or a blow to the head will, of course, suggest the diagnosis of traumatic subdural hemorrhage. In infants, however, the condition often develops without known injury or infection and thus it may present a problem in diagnosis. A subdural hematoma is a localized extra-arachnoid effusion of blood which may be unilateral or bilateral. The blood may remain liquid for months while an envelope of thin fibrous tissue encysts the hemorrhage and gradually increases in thickness and vascularity.

Ambroise Pare described subdural hematoma in 1559. Hippocrates was said to have recognized the condition. Pare and most of the subsequent writers were concerned with the condition in adults.[1] Klemme and Stuck reported 203 cases from the literature including 24 cases of their own.[2] Brody also reviewed the entity, subdural hematoma, in a recent article on acute craniocerebral injuries.[3] Davidoff and Dyke described what they termed "relapsing juvenile chronic subdural hematoma," which is always of traumatic origin.[4] In these cases the history is of the greatest importance and roentgenograms have been of great value.

In pediatrics we are especially concerned with chronic relapsing subdural hematoma or pachymeningitis hemorrhagica interna in infants. Since Virchow presented the first complete descriptions of the pathologic lesion a voluminous literature has accumulated.[4] The most concise recent article on this type of subdural hematoma was written by Buchanan. He thoroughly reviewed the literature and stated in 1936 that at least 127 proved cases had been reported in children under the age of fifteen years.[5] Love[6] and Northfield[7] have since reported typical cases. In 1939 Ingraham and Heyl[8] reviewed part of the literature and reported that 50 cases had been studied at the Infants' and Children's Hospital in Boston in the preceding ten years. They presented the last eleven cases which had been observed in the year ending July 1, 1938. These authors found subdural hematoma most often in undernourished children and reported a history of trauma in the majority of cases. They emphasized a most important point, namely, that the diagnosis is made in proportion to the intensity of the search for cases.[9] My first case was diagnosed and confirmed in December, 1938.

The theories concerning the etiology of subdural hematoma include the obvious one of trauma and Virchow's theory of inflammation. No satisfactory explanation has been advanced. In my practice trauma has been the logical explanation in older children. In this series of infants it is my impression that abnormal blood vessels are the causative factor. The defect may be congenital, that is, an anomaly such as an aneurysm or a defect in the wall of a vessel. Following a rupture of the wall and the resulting hemorrhage, an inflammatory reaction sets in. It would be difficult or impossible to identify the original defect or even the vessel involved after the hemorrhage. There has been no hypoprothrombinemia and no lowered ascorbic acid level in my cases. With the clot evacuated and the sac removed there has been no recurrence of hemorrhage in these infants. This would tend to strengthen the theory of a congenital localized defect in a vessel.

In older children the usual symptoms of traumatic subdural hematoma are headache and irritability which are exaggerated after exercise or after exposure of the bare head to a hot sun. In infants the symptoms are restlessness, irritability, and an increased intracranial pressure. The elevated pressure is indicated by a usually rapid increase in head size and increased tension over the fontanelle. This has often been accompanied by convulsions. There have been no localizing signs. Hydrocephalus is a common sequel in untreated cases.

The spinal fluid has been clear, colorless, and under no increased pressure in all but one of my cases. Subdural tap at the lateral angles of the anterior fontanelle reveals the diagnosis, with a bloody or a straw-colored

*Medical Director St. Vincent's Infant Asylum, Milwaukee, Wis.

fluid. In infants a spinal puncture is essential for differential diagnosis. Meningitis and subarachnoid hemorrhage must first be excluded. In older children as in adults, a spinal puncture is contraindicated if a subdural hematoma is strongly suspected. In these cases, a pneumoencephalogram or a ventriculogram is indicated for possible aid in demonstrating and localizing the clot.

I wish to present a resumé of six cases of chronic recurring subdural hematoma in infants which I have seen in my private practice in the past five years. In three cases the diagnosis has been verified by operation, in two cases the diagnosis was verified by pneumoencephalography.

Resumé of Cases

Case 1—R. W., a male infant, 6 months of age, was seen December 14, 1938. Three weeks previously the infant had a slight fever. This was ignored but three days later he had a generalized convulsion after which he was unconscious for 35 minutes. Since that time the mother had noted a gradual increase in the size of the head and an increasing fullness of the anterior fontanelle. Examination revealed the following positive findings: An alert, intelligent, well-nourished infant with a large head. The head circumference was 47.5 cm., the anterior fontanelle was tense and bulging. The spinal fluid was normal. Subdural tap on the right was dry; on the left 100 cc. of blood spinal fluid was aspirated. The taps were repeated seven times in the next week and blood fluid was aspirated from both angles of the anterior fontanelle. The infant was referred to Dr. Percival Bailey of Chicago who operated on January 10, 1939. The subdural spaces were opened and drained. The infant made an uneventful recovery and has been well to date (4 years).

Case 2—S. A., a female infant, 8 months of age, was seen on September 25, 1939. She had had convulsions at three months of age and a recurrence before this examination. Examination revealed the following positive findings: A well-nourished infant in coma with recurring generalized convulsions. The head circumference was 43.7 cm. The spinal fluid was normal. Subdural puncture yielded a few cubic centimeters of clear fluid on both sides, under no increased pressure. A pneumoencephalogram was done on March 26, 1940. The x-rays revealed a large collection of air in the subdural spaces. The infant has been kept on phenobarbital. An electroencephalogram on September 19, 1941, revealed generalized, increased cortical excitability. The infant died of pneumonia at 3 years of age.

Case 3—A. A., a male infant, 8 months of age, was seen January 10, 1940. The family physician reported that the boy rolled his head frequently and that the head had been increasing in size but very little in circumference for 4 months. Examination revealed the following positive findings: An alert, intelligent, well-nourished infant. The head circumference was 44.5 cm.; chest circumference 40 cm.; abdominal circumference 42 cm. The scalp veins were prominent and there was increased tension over the anterior fontanelle. Subdural tap at the left angle of the anterior fontanelle yielded a few drops of clear fluid; 15 cc. of bloody spinal fluid were removed from the right angle. Spinal puncture yielded a normal fluid under no increased pressure. Pressure over the anterior fontanelle was transmitted to the lumbar space. The Queckenstedt test was positive on the right side. The subdural drainage was repeated three times within the next seven days. After three days there was no increased tension over the anterior fontanelle and the infant was discharged to the family physician for further observation. The infant was referred back in three months because of headache and crying spells. A subdural tap revealed a few drops of clear fluid at the left angle of the anterior fontanelle and 10 cc. of bloody fluid at the right angle. The head circumference was 45 cm. The patient was referred to Dr. Paul Bucy, of Chicago, who exposed both subdural spaces on May 7, 1940. There was a small subdural hematoma on the right side and a small cyst with no blood on the left. Both sides were washed out and drained. The patient made an uneventful recovery and has had no recurrence of symptoms to date (3 years).

Case 4—J. F., a boy 2½ years of age, was seen May 3, 1940. He had had a convulsion at 8 months and about thirty since. There had been no response to phenobarbital. Examination revealed no findings of note. A pneumoencephalogram revealed a large collection of air in both subdural spaces. No

further treatment has been given.

Case 5—R. N., a male infant one year of age, was seen October 24, 1940. He had convulsions for one hour before admission. Examination revealed the following positive features: A very well developed, well-nourished infant in coma. The head was large, circumference 48.5 cm. Chest circumference 47.5 cm. The large anterior fontanelle was tense and bulging. The pupils did not react to light. The eyes were turned up and to the right. The blood pressure was 120/80. The spinal fluid was normal. Subdural taps revealed fresh blood at the right angle of the fontanelle. There were two convulsions involving chiefly the left arm and leg during the night. On the following day there was again increased tension over the anterior fontanelle. The pupils reacted to light and accommodation. Within the next four days the tension over the anterior fontanelle gradually subsided and the infant was discharged to the family physician for observation.

The infant was well until he had another convulsion on February 2, 1941, and was readmitted to the hospital. On admission he was comatose and in convulsions. There was slight bulging over the anterior fontanelle. The head circumference was 52 cm. The pupils were dilated and fixed. Subdural taps revealed old serum and fresh blood at both angles of the anterior fontanelle. The infant was quiet until the next day when he had a recurrence of convulsions. He was quiet, conscious, and rational three days. Subdural taps yielded about 2.5 cc. of xanthochromic fluid and blood clots at both angles of the anterior fontanelle. Following aspiration the fontanelle was soft. The infant was discharged on February 11, 1941.

He was well until April 11, 1941, when he had a convulsion. Examination revealed the patient in coma with no increased tension over the anterior fontanelle. The head circumference was 54.8 cm. Subdural taps yielded 2 cc. of old blood at both angles of the anterior fontanelle. The following day the infant was awake, rational, and responsive with no increased tension over the anterior fontanelle. On April 16 he was referred to Dr. A. E. Walker, of Chicago, who performed an operation on April 28, 1941. Burr holes were made in the both sides and both cysts were washed out and drained. The child made an uneventful recovery. He was readmitted to the hospital February 17, 1943, because of one convulsion which developed following a high fever (105° F. rectal). A diagnosis was made of croup. The child made a prompt recovery and was discharged on February 20, 1943. He was readmitted on March 4, 1943, after a convulsion with a temperature of 106° F. rectal. The child had an acute upper respiratory infection. His spinal fluid was normal. The head circumference was 55.75 cm. He was discharged on March 7, 1943. His mental development has been good.

Case 6—J. F., a girl 5 months of age, was seen in consultation with Dr. S. E. Kohn on May 5, 1943. The infant had had a cold and fever eight days before and vomited the next day (projectile), two days later became comatose, had alternating flaccidity and spasticity of the extremities. There was slight bulging of the anterior fontanelle and a rotatory nystagmus. The spinal fluid showed: xanthochromia, 13 cells, globulin 4+, sugar 49 mg. On April 30 the ophthalmologist found the eyes to be normal except for the nystagmus. May 1 there was a slight neck rigidity and the spinal fluid was bloody, cells 5100, globulin 4+, sugar 38 mg. May 3 there was a right facial palsy. May 5 there was a bulging of the anterior fontanelle, a lateral nystagmus and a generalized spasticity. Subdural taps revealed 2 cc. of old blood at the left angle of the anterior fontanelle and 2 cc. xanthochromic fluid followed by 1 cc. old blood on the right. May 6 subdural taps revealed ½ cc. old blood on each side. There was a continuous oozing of xanthochromic fluid through the right needle puncture for four days. May 7 and 10 a few drops of bloody fluid were obtained on punctures of both sides. The blood cultures and spinal fluid cultures were all negative. The infant has made an uneventful recovery to date.

Summary

In six cases of chronic recurring subdural hematoma in infants the following observations stand out:

1) The onset of symptoms began at 3, 4, 5, 6, and 8 months of age.

2) There were four male infants and two female.

3) All infants were in good nutrition.

4) There was no known trauma.

5) The symptoms were restlessness, irritability, headache, vomiting, convulsions, and hydrocephalus.

6) The three infants treated surgically made a complete recovery.

7) The signs were increased tension over the anterior fontanelle, increasing skull circumference, and bloody spinal fluid in the subdural space which tended to recur after evacuation.

Conclusions

Chronic recurring subdural hematoma in infants is a definite entity. It is suggested that the condition develops as a spontaneous rupture of congenitally defective or abnormal cerebral vessels in the subdural space. The condition usually develops in infants between 5 and 8 months of age. Early diagnosis and prompt surgical treatment usually results in complete recovery.

411 E. Mason St.

References

1 Pare, Ambroise quoted by Klemme and Stuck, ref. 2.
2 Klemme, R. M., and Stuck, R. M.: *J. Mo. State Med. Assn.*, 37: 347, (Aug.) 1940.
3 Brody, B. S.: *J. A. M. A.*, 115: 977, (Sept. 21) 1940.
4 Davidoff, L. M., and Dyke, C. G.: *Bull. Neurol. Inst. N. Y.*, 7: 95, (Sept.) 1938.
5 Buchanan, D. N.: *Practice of Pediatrics*, 1936, vol. IV, chap. 6, page 1, W. F. Prior Co., Hagerstown, Md.
6 Love, J. Grafton: *Am. J. Dis. Child.*, 53: 1528, (June) 1937, case report.
7 Northfield, D. W. C.: *Proc. Roy. Soc. Med.*, 32: 1200, (Aug.) 1939, case report.
8 Ingraham, Franc D., and Heyl, Henry L.: *J. A. M. A.*, 112: 198, (Jan. 21) 1939.

The Professional Neurosis of the Physician

Studies in Professional Neuroses No. III

ERNEST HARMS
New York, New York

In the first of a series of studies previously published,[1] I briefly discussed a form of occupational disease which I termed "medical neurosis." In that paper I presented the story from the general socio-psychiatric angle. In this article I should like to deal with this medical neurosis from the viewpoint of actual psychotherapy.

Not only lay people but physicians as well, will be astonished that there should be a specific disease connected with the profession which in itself labors against illness not only of the body, but of the mind; and it is a tragic fact that the medical profession does produce this mental illness.

Carl Spearman, the psychologist, remarks that the poet or author who has "psychological sensitivity" is better able to present a word picture of psychological factors than is the average laboratory scholar who does not have this gift of words. The statement is true not only in the field of abnormal psychology but also in medical science as a whole. Such a description, or elaborated case history is especially valuable if the author has a satisfactory professional background. An outstanding example is found in the novel "*The Fool of Faith*," written by the Finnish doctor, Dr. Jarl Hemmer.[2] He exhibits typical "medical neurosis" when he writes so vividly of the prison physician in a Finnish citadel during the war of independence wherein were confined bandits, spies and criminals of every description, in an atmosphere of disease, hunger and depravity. No one on the prison staff can endure the atmosphere. Even the priest eventually breaks down and commits suicide. Only the doctor keeps himself emotionally aloof. He accomplishes this by developing a mental hardness, a kind of stern, materialistic philosophy of life towards humanity. In this way he has rationalized those ethical doubts and inner scruples, which ultimately led the clergyman to take his life. The doctor retreats into a world of his own conception. He has found an inner personal life to which he retires whenever he has a minute to himself. He rushes to his own quarters and scratches away on an old fiddle, playing religious music primarily, but denying religion *per se*.

In the novel, there are very long monu-

mental discussions between the priest and physician and the latter confesses in a roundabout manner, his inner mode of life and his mental development. We learn how severely neurotic he is and how tragic is his illness. He had been a rather sensitive, idealistic youth, who after selecting medicine as his profession, found himself forced into a system of thinking contrary to his early mental and psychic disposition. What medicine taught him about human nature forced him to suppress many of his actual spheres of experience. He sacrificed his inner life to the medical world concept, with experiences leading to an inner tragedy which the psychotherapist will recognize as early symptoms of a mental illness. He relates that he has often had deep desires for relationship with women and thoughts of marriage, but when he sought relaxation in female company he was beset by the most awful forebodings which would block any further growth of deep affection; i.e., should he admire a cluster of curls at the nape of a child's neck, up popped thoughts on the unhygienic aspect of hair worn in that fashion; how perspiration might develop under them. These crude oppressive medical thoughts increased as he advanced with his studies. An oasis of his inner life had always been music. Even this refuge he lost. He could not go to a concert and listen quietly because his mind became obsessed with thoughts of the masses of feces in the intestines of the audience. It is evident even then that he was a sick man. Nevertheless, he carried on with his profession, but his illness forced him to retire more and more within himself and thus he became alienated from the world. The book ends with the doctor in this unbearable position, a barricade for his crude thoughts, and nursing his shadowy inner life with religious music squeakily played on an old fiddle.

General Somatic Considerations—There is no doubt that Hemmer's doctor is a very sick man, but fortunately it is a rarity that such a severe case had as its background the medical profession. But is this form of neurosis really so unusual? In studying the somatic situation extensively, it will be observed that in a milder form a general disposition to medical neurosis is more common than supposed. Many physicians if they look into their minds and hearts will be forced to confess that consciously or semi-consciously they are involved in similar conflicts giving vent in nervous irritability of one kind or another. Analyzed on a broader somatic scheme this pathogenic situation will reveal serious social and medical problems which have their genesis in the initiation of the physician into his profession. A tragic dualism lies at the root of this professional illness which can be uprooted only by a free discussion of the condition.

I will make a personal observation. When I was a student, I was elected governor of a large fraternity and had the responsibility of counselling younger students. I was able to observe general and individual conditions among my medical student friends. Their disposition was neither pleasant nor happy. They exhibited a circumscribed behavior pattern. It was ironical, satirical, cynical, and they held those ideals in low esteem, which other students regard highly. All ideals and decent sentiments were villified. As a consequence, they earned themselves the title—"medi-cynics." After having had so many medical students come to me with their inner conflicts, I was able to evolve a psychological answer to the problem. It was not an individual but a professional problem, due to the fact that the study of medicine is based on a tragic inner contradiction.

Here are the genetic factors. After a student has learned something about the horrors of bacteriae and disease and decides to become a physician, he becomes imbued with the grand professional ideal that he is to become a healer and helper of mankind. This motivates his professional approach. However, as soon as this idealistic neophyte of Aesculapians opens the door of the anatomy lab, or a surgeon's office, or the dispensary ward of a great hospital, he becomes profoundly shocked by the horrors he must experience. Here is the touchstone to his idealism which may indeed vanish completely. Since there are so many social factors involved in the study of medicine, this youth who has been severely hurt and emotionally bruised by his experience does not leave the profession, but instead develops a defense mechanism which manifests itself in irony and cynicism concerning life's ideals. The thought that life has become soiled and bitter is the leitmotif of his mental background. The rupture with the neophyte of Aesculapians

is complete and he goes on his ironic way. This is only a minor part of the situation which has many and varying facets. The physician builds up a defense of his profession along these lines and develops a philosophy which suppresses everything that is contrary to this behavior pattern. One doesn't have to be a Freudian with a dogmatic belief in the dangers of suppression to comprehend that this inner contradiction with Aesculapians must lead to some unhappiness or even to an actual neurotic state; which condition I call medical neurosis.

This medical neurosis is not a simple mental disease which can be easily described and determined, and as a somatic picture it is even more difficult to describe. This is true of most mental diseases which although we fit into categories have no clearly defined borders. Medical neurosis is especially difficult to deal with theoretically because it is socially determined and individual psychiatry is insufficient. Social psychiatry is needed to cope with this problem.[3]

The Social Psychiatric and the Individual Psychiatric Aspect—Social psychologists familiar with problems of professional activity may maintain that emphasis of a specific medical neurosis is unreasonable, as there are unsatisfactory situations in every profession which could lead to some sort of unhappiness or to some more serious mental conflict. I am trying to avoid such rather general superficial observation by this study in professional mental disease. We know practically all of the difficulties that may lead the physician to a psychopathic state. Nevertheless his neurosis is least observed.

There are a great number of professional tragedies resulting from specific configurations of the legal and clerical professions, attested to by the many novels and short stories written during the past fifty years about German, French, and Scandinavian clergymen and attorneys breaking down professionally. Casually there is great difference in the situation affecting these two professions and the medical profession. The former break down because they do not properly fulfill their duties or sin against their proper tasks. This is not the reason in the medical profession. Its cause lies in the contradiction between the profession itself and the human and mental demands of a sound personality. The problem is practically reversed.

Social psychologists may say that the entire question is not serious. From a general social point of view that may be so, but not from the psychotherapeutic aspect. We have learned from Carl Gustav Jung that cause and cure of any mental or psychic pathology are logically connected. This means that no perfect cure can be achieved unless the cause of the pathology are known and eliminated. This is the basis for social psychiatry as a study of the social causes for mental disease. Thus we have a social therapy which can cope adequately with those forms of mental disease which actually are caused by environment.

What I have designated as medical neurosis is a very specific form of such socially conditioned neuroses. There is no doubt that the problem described in Hemmer's case and my personal observations must be considered as social conditioning. Later we shall consider the individual psychiatric aspect and see how the social phase becomes transformed by a contradictory viewpoint. We must study from still another angle what is probably the actual social cause of medical neurosis. There are, of course, many other connected factors, for example: legal and criminal activity, personal danger, the paradox of the doctor fighting a disease and earning his living from that which he combats, rapid cures with small fees and slow cures with large ones; and finally new medications and the experimenting on the patient. The foregoing rarely leads to a genuine neurotic state because they are only temporary annoyances which do not affect the inner life of the physician. Beyond these, however, there is a chronic problem directly connected with this occupation. It is its permanent character which causes it to create a neurotic state in doctors who have become influenced by it. This too is a real social cause. If an individual is brought into a more or less psychopathic condition by a negative influence, whether for a short or long time, we must maintain that that individual has been ill before or has the neurotic disposition to become ill. A permanent negative influence can make even the healthiest individual pathologic.

This brings us now to the individual psychiatric consideration of medical neurosis. It is the specific for most socially conditioned neuroses which result in various forms of

psychopathology as we know them in individual psychiatry. In viewing our special form of medical neurosis, we encounter the same fact. In the records of many cases we find not only many patterns of mild neuroses, but also such severe forms as drug addiction, alcoholism and even suicide. Most frequently we observe a profound pessimism conducive to various depressive states. We also find many neurotic conditions due to suppressions and fear complexes of the worst sort. It is not always easy to discover the actual cause through analytical investigation, and the real cause is not obvious to the patient, especially the physician-patient, for he puts up a stronger intellectual defense than most lay patients. In the analysis of medical neuroses one has to be aware of this powerful intellectual defense of the neurotic physician and of the greater effort required to confess to himself that professional sources are the cause of his state of mind. Among the serious neuroses observed were mild forms of dementia praecox and a considerable number of alcoholics and drug addicts, morphinists in particular. In my recorded cases are two such addicts, one ending in suicide. Of course it would be going too far to expect that any mental disease in a "medic" should be professionally determined. In any case if there is no organic background, the question arises whether professional circumstances have primarily or secondarily induced the illness. This has yet to be investigated.

That social circumstances do play a fundamental role is evident and we must approach the problem from a definite social therapeutic point of view if we wish to achieve genuine cures. The problem of social therapy is usually overlooked in treating a neurosis which is socially and professionally conditioned.

The Therapeutic and Prophylactic Aspect—Socially therapeutic results can be obtained only when the socially conditioned mental illness has been completely rearranged and erased from the consciousness of the individual so that it is no longer a future pathogenic factor.

In medical neuroses we are dealing with a physician whose activity in his profession has led to more or less severe mental suffering. In treating them, we apply the usual means of individual therapy, but from the onset the social aspect should be kept in mind and it should be included in the cure (healing process).

It may seem sound therapy to transfer the physician-patient to another professional sphere. This may be necessary only in severe cases where it will be the initial therapeutic measure. The next step in the cure is the development of a clear insight into the actual neurotic state and his professional dissatisfaction. Psychotherapists treating such medical neurotics often wonder how their colleagues can be so blind to their own mental condition. To complete the therapy it is necessary to fix in the patient's mind, that place which his profession should finally hold. Since most mature physicians feel that they ought to continue their profession or that they are too old to learn a new one, it is essential to find a balance between professional activity and leisure time. In striking a proper equilibrium, we have solved the problem. It may be necessary to suggest to the younger man that he change his profession or specialize in one of the less depressing fields of medicine. He could become a pharmacist or manufacture surgical instruments. It must be constantly born in mind that the actual therapy involves the complete erasure of the professional pathogenic factor and nothing can be gained until the professional problem is satisfactorily solved.

Last, but definitely not least, let me add some prophylactic considerations. What can be done to avoid medical neuroses? The answer is two-fold:

Firstly: we are concerned with the individual physician and the means by which he can avoid mental suffering and illness when the seeds of dissatisfaction have become imbedded in his mind. If he would continue his profession, which is what most of these patients wish, considering the expense and time expended, then he must settle this problem of his occupation. Since the physician, more so than any other professional group has from time immemorial exhibited unusual foresight in all social dilemmas, the really wise modern doctor will develop for himself a protecction against the insidious onesidedness of his profession. We find that our suggestions in one way or another have already been adopted, primarily, however, by men not affected by the medical neurosis. Many physicians not satisfied with their medical sphere of activity have

taken additional philosophical studies and even work towards a Ph.D. In fact, taken by and large there is no profession that uses its leisure time to sounder advantage.

I was never more deeply impressed than when I attended an exhibit at the New York Academy of Medicine of paintings executed entirely by New York physicians. In all the time that I have been connected with the medical profession and with psychotherapeutists, few things have stood out so clearly and magnificently.[4]

To give a descriptive title to all the attempts of the physician at sustaining himself emotionally in the face of the inner conflicts which are entailed in his profession, we can call it a balancing of his mental difficulties. Frequently, of course, there are less diligent attempts to materially strengthen the physician's psyche, resulting in further suppressive difficulties not always understood as the cause of later mental illnesses.

The second prophylactic aspect is that which I consider the most important message of this paper. It is the need of a fundamental change in the system of medical education, especially as it is carried on in the United States today. I have the highest regard for the thorough training given by medical schools on this side of the Atlantic. It more than favorably compares with the less intensive systems in practice on the European continent. The only fault is that the curriculum does not permit opportunity for the development of an inner life and a total personality for the medical student, since he attends classes from early morning till late afternoon and then is at his books late into the night. Is it any wonder then that this medical neurosis is so prevalent among the youth of the United States? It is not necessary to enter upon the moral question of whether a nation can afford to breed generation after generation of physicians with a definitely unhealthy mentality caused by an impossible and practically inhuman system of medical education. It is not my task to venture any suggestions to medical instructors on how a safe, sound and sane medical school should be run. However, as a representative of social psychiatry, it is my duty to point out one of the sore spots in our educational system, which when corrected will bear the satisfying fruit of good pedagogy, which is more satisfying than certain sentimental and superficial advances of which we are so proud. Without a doubt we have the most impressive medical schools in the world and they are run with a maximum of physical efficiency, but to quote the classic question: "What benefits the student these marble halls and wonderfully constructed laboratories, if his soul becomes infected with the terribly tragic germ of mental illness and social inefficiency!"

58 West 56th Street.

References

1 "Social Background of Occupational Neuroses," *Journal of Nervous and Mental Disease*, 85: 689-695, 1937.

2 Liveright, N. Y., 1935. The original edition appeared in Swedish under the title *En Man Och Hans Samvete* Bonniers Forlag, Stockholm, 1931, receiving the first prize in the great Nordic novel competition for that year.

3 Harms, Ernest: "Psychiatric Nomenclature," *Am. J. of Orthopsychiatry*, 1939.

4 Harms, Ernest: "The Psychotherapeutic Application of the Arts," *Occupational Therapy and Rehabilitation*, Vol. 8, (Aug.) 1939.

"PSYCHIATRY IS A NECESSARY ADJUNCT TO MEDICAL PRACTICE"

For a clear understanding of this subject read

DISEASES OF THE NERVOUS SYSTEM

(A PRACTICAL JOURNAL)

Published Monthly: Only $2.50 per year—subscription

PHYSICIANS POSTGRADUATE PRESS

500 NORTH DEARBORN STREET—CHICAGO, ILLINOIS

Neurological Clinical Pathological Conference

of the

Cincinnati General Hospital

CASE NP-38-181

Presentation

A 64-year-old white man had had an occasional cramping sensation in either hand lasting about one hour, appearing first in the summer of 1936. He thought that about the same time the skin of the hands and between the toes began to crack and peel. The dermatitis which may have been minimal for several years responded, apparently to ointment. In late November the hands and face began to swell and this swelling lasted three or four weeks. In late December the edema was minimal and by that time there were cutaneous lesions. In March 1937 he was seen by a dermatologist, who noted some fungus infection and possibly contact dermatitis. On June 9 the patient complained again of recurrent edema and dermatitis of the hands and feet. At times the eruption became generalized and although it was mild it was accompanied by considerable itching. Physical examination at this time revealed nothing abnormal besides the cutaneous stage. On June 15 the patient noted pain and stiffness in the right leg. Objectively nothing abnormal was found in this extremity. On June 23 swelling of the fingers was observed. In July he complained of intermittent pain in the shoulders, upper extremities, and in the knees and feet. At this time he was unable to make a tight fist because of the tenseness of the skin of the hands. In August he began to experience difficulty in swallowing and in clearing his throat.

In October a thorough examination showed several abnormalities. The patient was emaciated, he had lost 15 pounds in weight in four months. The joints of his hands were swollen. The skin of the hands was glazed and slightly thickened and was dry, cracked, and scaling, especially over the pads of the fingers. The voice was nasal and he had great difficulty in swallowing. Water regurgitated through the nose. Observation of the vocal cords and soft palate revealed no abnormality. He felt generally weak, and had considerable difficulty in phonating.

Neurological examination done in early November revealed normal cranial nerve findings except for a moderate right lower facial weakness. His pharyngeal reflexes were active. When the pharyngeal reflexes were tested, he would gag, wheeze, and expectorate, and it would require two or three minutes for him to regain his equilibrium. The uvula appeared to flap loosely in the currents of air, the soft palate rose in the midline. Movements of the jaw, neck, and tongue were normal. There was no atrophy of the muscles of the face. There was generalized reduction in the bulk of the musculature in the extremities, but no weakness could be demonstrated with the ordinary tests. Posture was abnormal. On standing his head flexed forward, so that the chin was very nearly rested on the chest. The scapulas protruded posteriorly, the abdomen protruded markedly. The gait was normal. The only sensory abnormality was a diminution in the appreciation of vibration of about 50 per cent in the lower extremities. The tendon reflexes were normal, except the ankle jerks which were reduced in volume. The skin of the hands was dry, red, and scaly. Subjectively he was considerably bothered by weakness, and complained particularly about the clumsiness of his two index fingers. He was quite discouraged.

On November 30 marked wasting of the small muscles was evident. The voice was of nasal quality and he frequently regurgitated food through the nose on attempting to swallow. The appreciation of vibration was diminished at the ankles. There was intermittent, mild diarrhea and sore tongue. In January, 1938, it was observed that the patient was having even more difficulty with his bulbar functions. Death occurred on January 12, 1938.

Laboratory Data—Vital signs were within normal limits throughout the illness. Repeat-

ed examination of the blood and urine revealed no abnormality. In October, 1937, the sedimentation rate was normal. There were several negative blood Kahn and Wassermann reactions. Fasting blood sugar determinations, and a glucose tolerance test, were normal. A gastric analysis revealed free hydrochloric acid. The cerebrospinal fluid was normal.

The basal metabolic rate was normal. An electrocardiogram done in June, 1937, revealed low voltage in all leads and an inverted T wave in lead 1. Another in October, 1937, presented the indications of moderate myocardial damage.

Considerable roentgen study was made of the gastroenteric tract which usually contained a considerable excess of gas. In November, 1937, fluoroscopic examination of the esophagus with a thick mixture of barium showed the clinging of much of the barium to the uvula and to the pharyngeal wall. There was considerable retroperistalsis in the esophagus. Five days later a roentgen film of the neck showed dilatation of the pharynx, and air in the upper portion of the esophagus. Small amounts of barium remained in the region of the epiglottis from the previous examination.

In October, 1937, films of the hands showed decalcification of all bones which was thought to be on an infectious arthritic basis. Plates of the head, cervical spine and chest were normal.

Differential Diagnosis

Doctor Harry Salzer: I think that in this case we have to decide whether or not there is a lesion in the nervous system. The findings do not favor it. There was no reflex alteration except of the ankle jerks which may be reduced without significance in a person of 64. No mention is made of sensory change except diminution in the appreciation of vibration which also may be related to age. At first sight the nervous system is exonerated.

The patient had a combination of dermatitis and muscle disease, therefore dermatomyositis should be a primary consideration. There are other conditions which have to be differentiated, bulbar palsy for example. Pseudobulbar palsy would be most unlikely since paralysis was not observed. A bulbar palsy in a man who had dermatitis would have to be considered. Against this diagnosis is the fact that this patient never had fasciculations in his muscles, or fibrillations in his tongue. Movements of his tongue were normal which would mitigate against the diagnosis of bulbar palsy, wherein the tongue lies relatively immobile on the floor of the mouth. Another disorder which might be considered is myasthenia gravis, against which there was no atrophy of the facial muscles, no weakness of the jaw or of any of the muscles innervated by the cranial nerves; and no weakness in the extremities. With extensive involvement of muscle in myasthenia gravis one would expect weakness of the muscles of the face and head.

During the course of the illness, there were signs of vitamin deficiency; mild diarrhea and sore tongue, probably related to his inability to swallow.

There are a number of points in favor of dermatomyositis, among them development of the skin lesions in the hands and feet. In November, 1936, the patient began to have edema of the hands and face; and pain and stiffness in the leg occurred in June, 1937, six months before death. Edema, pain, and stiffness of the limbs are frequent symptoms of dermatomyositis. I think too the difficulty in swallowing and of clearing the throat would favor this diagnosis, since patients with dermatomyositis have been reported as having weakness of the pharyngeal muscles. In myasthenia gravis and bulbar palsy there is also great difficulty in swallowing and phonating, and there may be regurgitation. Myasthenia gravis or bulbar palsy with some amyotrophy of the posterior neck muscles might explain the posture of the head.

There is one more point to be made—the abnormal electrocardiogram. Patients with dermatomyositis may have alteration of the cardiac muscle, and tachycardia is the usual evidence of the myocardial damage. So that it may be that the state of the heart is also indicative of dermatomyositis, which seems to be the most logical diagnosis.

Student: How can you tell the difference between scleroderma and dermatomyositis without muscle biopsy?

Doctor Salzer: I think the "pseudo-neurological" picture presented by this patient is against the diagnosis of scleroderma. The texture of the skin is against it, this patient

had dermatitis.

Doctor Charles D. Aring: Has anyone seen scleroderma progress so rapidly to death?

Doctor Salzer: No. The average duration of dermatomyositis is about two years. Forty per cent is the total mortality, of the patients who expired 65 per cent died within a two-year period.

Doctor Marian A. Blankenhorn: Do you think that regurgitation can be explained by weakness of pharyngeal muscles? Have you found the record of any patient with dermatomyositis regurgitating food through the nose?

Doctor Salzer: There are cases on record with weakness of this sort, and we now have a patient on the ward with dermatomyositis and dysphagia.

Doctor Blankenhorn: The main difficulty in dermatomyositis is from weakness and contracture of muscle. The mouth cannot be opened readily because there is contracture. There isn't any mention of contracture in this protocal. The posture of the head in dermatomyositis usually is not due to weakness of the neck, but to shortening of the sternocleidomastoid muscles.

Doctor Aring: The posture was due to weakness in this case because it was not present at all times. It usually was seen when he walked about. Sitting and unfatigued he held his head and shoulders up very well. However, on passive movement of the extremities the joints could not be completely extended or flexed.

Doctor Blankenhorn: Could he lift his head off the pillow?

Doctor Aring: I didn't see him in the final month, but at no time was he bedfast. This posture was noted only when his gait was tested. Then the head would drop and the scapulas flared.

Doctor Blankenhorn: Except for the lack of contracture, and for the regurgitation of food, the diagnosis of dermatomyositis fits completely. The cracking between the toes is rather unusual in dermatomyositis. There may be some diagnostic confusion between dermatomyositis and arthritis, where there is redness, pain, and some swelling shown by conspicuous knuckles. In patients I have seen, dermatomyositis could be mistaken for trichinosis, and even erysipelas, when the redness and swelling involved the orbit.

Clinical Diagnosis—Bulbar palsy.

Doctor Salzer's Diagnosis — Dermatomyositis.

Anatomical Diagnosis—Dermatomyositis.

Pathological Discussion

Doctor I. Mark Scheinker: The body was extremely emaciated. The skin did not appear to be abnormal. The tongue was slightly atrophic. There was marked atrophy of the muscles of the neck. The sternocleidomastoid muscles were pale and string-like and the trapezius showed marked atrophy. The trunk and spinal musculature was atrophied, pale, and gelatinous in appearance. The adipose tissue was scarce. There was slight congestion at the bases of the lungs.

Microscopically the muscles showed marked changes. There was diffuse proliferation of round cells, mostly lymphocytes in the muscles. In some places, the muscle was remarkably well preserved except for the infiltration with round cells. The great majority of muscles were rather completely degenerated and replaced by connective tissue. Scattered areas of muscle tissue had been replaced by proliferated sarcolemmal nuclei.

Evidently the process began with swelling and edema of the muscle, and infiltration of round cells. Then the sarcolemmal nuclei proliferated. The final stage was represented by scar formation. It is interesting that different stages of the same process were seen in the same muscle. These changes were found in all of the skeletal muscles that were examined.

The heart demonstrated degenerative change of the muscle characterized by pallor and loss of staining ability. No inflammatory changes were disclosed.

The central nervous system was normal except for the presence of mild degenerative alteration of some of the nerve cells of the medulla and brain stem. These changes were characterized by a moderate degree of chromatolysis and fatty degeneration. There were no inflammatory changes and no areas of tissue destruction present. The leptomeninges and blood vessels did not disclose any abnormalities.

Doctor Blankenhorn: I would like to ask Doctor Scheinker if the inflammatory changes found in this case differ from the round cell infiltration of muscle, described as lymphorr-

hages in myasthenia gravis.

Doctor Scheinker: In the lymphorrhages of myasthenia gravis one finds in the muscle circumscribed accumulations of round nuclei without degeneration of muscle. In dermatomyositis the round cell infiltration is not circumscribed but diffuse, and it is associated with marked degeneration of the muscle, and with proliferation of the sarcolemmal nuclei.

Book Review

ROENTGEN TREATMENT OF DISEASES OF THE NERVOUS SYSTEM. Cornelius G. Dyke, M.D., and Leo M. Davidoff, M.D., Lea and Febiger, Washington Square, Phila., Pub., 194 pages, price $3.25.

The authors present an excellent survey of their knowledge of the use of roentgen therapy in diseases of the nervous system. The book is divided into two sections. The first section, of 13 pages, reviews the literature on the reactions observed in normal nerve tissue after exposure to varying doses of radium and roentgen irradiation. The work reviewed is on animal experiments.

The second section is devoted to a more complete discussion of the use of x-ray in the treatment of various pathological conditions of the nervous system. The treatment of brain tumors is discussed in great detail and makes up the greater part of the book. This section contains a survey of the literature on irradiation therapy of brain tumors. The authors then present, in detail, the techniques used in the x-ray treatment of brain tumors in various clinics as well as that used in their own practice. The results of treatment are well presented for the various types of tumors and the discussion illustrated with brief case reports. This section of the book is excellent and will be of great value to the practicing neurologist, although many may find it con-

(Continued to page 320)

NORTH SHORE HEALTH RESORT

WINNETKA, ILLINOIS

On the Shores of Lake Michigan

- **Homelike Environment**
- **Attractive Furnishings**
- **Spacious Landscaped Grounds**
- **Moderate Rates**

A completely equipped Sanitarium for the care of nervous and mental disorders, alcoholism and drug addiction, offering all forms of treatment, including electric and insulin shock.

Attractive restful surroundings for convalescents.

SAMUEL LIEBMAN, M.S., M.D.

Medical Director

225 Sheridan Road ***Phone Winnetka 211***

Rogers Memorial Sanitarium

OCONOMOWOC, WISCONSIN

Telephone 448

A PRIVATE sanitarium (incorporated not-for-profit)

for the treatment of

Diseases of the Nervous System

All approved methods of therapy are used

Resident Physicians

JAMES C. HASSALL, M.D. — *Medical Director*

CHARLES H. FEASLER, M.D.

An Institution for the study and treatment of Nervous and Mental Disorders.

Write for booklet.

JOHN H. NICHOLS, M.D., *Medical Director**
R. R. GOULD, M.D., *Acting Resident Director*

EST. 1898
*Military Leave of Absence

HERBERT A. SIHLER, *Director*
EDMUND V. SIHLER, *Assistant Director*

WINDSOR HOSPITAL

CHAGRIN FALLS, OHIO • Phone: Chagrin Falls 7347

Member American Hospital Association and Central Neuropsychiatric Hospital Ass'n.

GENERAL INFORMATION

ORIGINAL ARTICLES only are published with the understanding that they are contributed exclusively to this Journal. Manuscripts offered for publication, correspondence relating to the editorial management and books for review should be sent to The Editor, DISEASES OF THE NERVOUS SYSTEM, University of Texas School of Medicine, Galveston, Texas. The publishers are not responsible for statements made or opinions expressed by contributors in articles published in its columns. All manuscripts are subject to editorial modification.

CUTS FOR ILLUSTRATIONS, DRAWINGS and CHARTS will be supplied without charge in moderate number, but special arrangements must be made with the editor and publishers for excess illustrations and elaborate tables.

REPRINTS are furnished on order only and must be requested of the publishers when galley proofs are submitted. Prices will be quoted at that time.

COPYRIGHTS cover publication in DISEASES OF THE NERVOUS SYSTEM and articles may not be reproduced without permission of the publishers.

BUSINESS CORRESPONDENCE regarding subscriptions, advertisements, and other business of DISEASES OF THE NERVOUS SYSTEM should be addressed to the publishers, Physicians Postgraduate Press, 500 North Dearborn Street, Chicago, Illinois.

CHANGE OF ADDRESS NOTICES should include the old as well as the new address.

PREPARATION OF MANUSCRIPTS

MANUSCRIPTS must be typewritten, double spaced, with good margins, on one side of the paper only. Send original copy to the editor, retaining a carbon.

DRAWINGS AND CHARTS must be made with BLACK INK to permit of best reproduction. Photographic prints of plates or slides on glossy paper produce the best half-tones. Write the number of each illustration, drawing or chart on the back thereof together with the author's name and abbreviated title of the article.

LEGENDS FOR ILLUSTRATIONS, etc.: Typewrite list of same at end of manuscript with reference to number of illustration, drawing or chart.

BIBLIOGRAPHIES: Prepare carefully and fully to avoid confusion. Include in each reference (1) Number, (2) Author's last name followed by initials, (3) Title of article, (4) Name of periodical or book, (5) Volume, page and year if a periodical OR publisher if a book, viz.:

1. Bennett, A. E.: "Therapeutic Principles in the Care of the Psychoneuroses," Dis. of N. S., 111: 2, 1942.

Place list of references at end of article, not in footnotes. Arrange in numerical order.

FULL ADDRESS of author should appear somewhere on manuscript, preferably at the end.

BOOK REVIEW

(Continued from page 318)

venient to omit reading the detailed instruction for the exposure to the deep therapy apparatus.

The latter portion of the book discusses in brief fashion the roentgen therapy of various diseases of the nervous system and various chronic afflictions of unknown etiology. The reviewer regrets that this section, especially that portion devoted to the disorders of the peripheral nerves, was not presented more completely.

The book is recommended as an excellent review of the present status of roentgen therapy of tumors of the nervous system.

Jack R. Ewalt, M.D.

SUBSCRIBE TO

DISEASES OF THE NERVOUS SYSTEM

"A Practical Journal of Psychiatry and Neurology"

—$2.50 Annually—

COSTEFF SANITARIUM

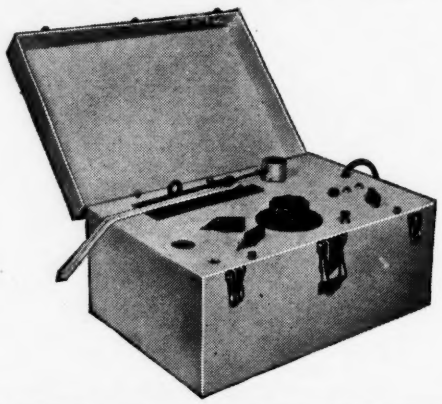
NERVOUS AND MENTAL DISORDERS
Shock Therapy (Insulin, Metrazol, Electroshock)
Home Environment
HARRY COSTEFF, M.D., *Psychiatrist*
1109 N. Madison Avenue—Peoria, Illinois
Telephone—4-0156

HIGHLAND HOSPITAL, Inc.

Affiliated with the Psychiatric Department of Duke University. For the modern treatment of mental and nervous, and habit disorders.
Robt. S. Carroll, M.D., Medical Director
Asheville, North Carolina

Garceau Electroencephalographs

NO BATTERIES — A. C. OPERATED
REQUIRE NO SHIELDING — INKLESS WRITING
PROMPT DELIVERY — SHIPPED READY TO RUN



THE JUNIOR GARCEAU ELECTROENCEPHALOGRAPH

A simplified inexpensive instrument for recording electrical potentials of the brain. Built-in interference eliminators permit use anywhere. Inkless records—no photography or film-development required. Instantaneous localization with any 2 of the 10 provided leads.

All Garceau Electroencephalographs operate entirely from the 115 volts, 50 or 60 cycle power lines.

Electro-Medical Laboratory, Inc.
Holliston, Massachusetts, U. S. A.

50 Beds **THE RETREAT, Inc.** Est. 1905
DES MOINES, 12, IOWA
For the diagnosis and treatment of Nervous and Mental Disorders in a homelike environment.
OCCUPATIONAL THERAPY, PHYSIOTHERAPY and SHOCK THERAPY
RUSSELL C. DOOLITTLE, M.D., *Medical Director* SYDNEY L. MACMULLEN, *Business Manager*
RICHARD S. AHRENS, M.D.
Member Central Neuro-Psychiatric Hospital Association

GLENSIDE
JAMAICA PLAIN, BOSTON, MASS.
A small, attractively located sanitarium for nervous, mild mental or chronic illnesses.
MABEL D. ORDWAY, M.D.
6 Parley Vale Tel. Jamaica 0044